

**ECONOMIC RESEARCH SERVICE
U.S. DEPARTMENT OF AGRICULTURE**

ABSTRACT

The effects of alternative beef import policies on price and output responses in the beef and pork sectors of the livestock-meat economy are analyzed for the period 1971-80. A base model, representing the current meat import regulation, was used to project the behavior of these sectors through 1980. Then the base model was modified to simulate alternative import policies and the results were compared with the base projection values. A restrictive import policy which reduced beef imports to zero by 1975 resulted in a smaller supply of meat at somewhat higher hog and steer prices. A liberalized import policy allowing beef imports to double in the 1970's resulted in greater beef supplies at lower prices for Choice steers and hogs. An increased supply of lower grade beef became available to consumers as the supply of fed beef declined. A quarterly quota, somewhat more restrictive than current regulations, stabilized beef imports at slightly lower levels than the current policy and resulted in further growth of the domestic beef industry compared with the base projection values. A policy to stabilize the supply of nonfed beef at 36-40 pounds per person per year showed a lower rate of growth in the domestic cattle industry. A policy to stabilize Choice steer prices through controls of beef imports achieved a gradual upward trend in steer prices with some seasonal variations, no significant effect on hog prices, and limited growth of the domestic cattle industry.

Key Words: Beef, imports, simulation.

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SUMMARY

In recent years, imports of red meat have been limited under provisions of the Meat Import Act of 1964. Sharply divergent views as to the effect of this import policy--as compared with other possible import policies--led ERS to undertake this analysis of the effects of a range of possible import policies on prices and production of beef and pork.

In all, five alternative policies were examined. Two import policies might be regarded as limiting situations. One reduced imports gradually until 1975 and then continued with imports reduced to zero through 1980. The other portrayed the opposite extreme--the initial estimate of beef imports was doubled each quarter, approximating a liberalized trade policy. The remaining three alternative import policies involve lesser changes from present policy: quarterly quotas with some overall reduction in imports, maintenance of a target supply of low-grade beef, and variation of imports to minimize cyclical price fluctuations.

For each of these import policies, prices and production of beef and pork and the size of the domestic beef herd are compared with expected results under the current policy (the base projection) through 1980. Regardless of the import policy adopted, prices of beef and pork were generally as high as recent years or higher and adequate supplies of beef and pork were available for consumption.

No value judgments are made about the relative merits or disadvantages of the various policies. What is "best" or "least best" for producers, consumers, or others in the beef industry depends on their special criteria and interests.

Comparison of simulated values under alternative policies with those under the current situation--the base projection--provides insight into what might happen to prices and domestic production in the U.S. livestock industry. These simulated values are not forecasts of future prices and output. The simulations assume no change from the base period in either industry structure or basic economic and behavioral relationships affecting production and consumption of livestock products. Furthermore, the simulations are based on specific assumptions regarding future values of variables such as income and population growth and feed grain prices. To the extent that industry structure and basic economic relationships change and future values of major variables differ from those projected in the analysis, prices and output of livestock realized in the future will differ from those projected in the analysis. However, the analysis does provide useful insights into possible impacts of changes in beef import policies since each of these comparisons is based on the same industry structure, basic economic and behavioral relationships, and assumptions.

EFFECTS OF ALTERNATIVE BEEF IMPORT POLICIES ON THE BEEF AND PORK SECTORS

by Andrew Duymovic, Richard Crom, and James Sullivan
Agricultural Economists, Marketing Economics Division

INTRODUCTION

The current meat import regulation--the Meat Import Act of 1964 (P.L. 88-482)--is based on a market-sharing principle. It provides an import quota for fresh, frozen, and chilled beef, veal, mutton, and goat meat amounting to 7-8 percent of domestic commercial production of the products covered. Thus, it allows importers a proportionate share in the growth of the U.S. market. In recent years, the effectiveness of the statutory quota, which is geared to domestic production, has been questioned. Primary concern has focused on whether it is adequate to protect domestic livestock prices and still provide adequate lean meat supplies. A variety of proposals to change the present regulation have been advanced by interested groups.

CURRENT IMPORT REGULATION

The existing regulation provides the following bases for determining the level of import quotas for the major beef, veal, and mutton items:

(1) A base quota of 725.4 million pounds, product weight (the average imports of the covered items during the 5-year base period 1959-63).

(2) An adjusted quota equal to the base quota, increased or decreased for each calendar year by the same percentage that average annual domestic commercial production of the covered products in the preceding 2 years and estimated production in that calendar year increases or decreases in comparison with the average annual commercial production during the base period.

(3) A trigger point for the imposition of quotas. Under the law, the Secretary of Agriculture is required to make quarterly estimates of calendar year meat imports and, if his estimate for any calendar year exceeds 110 percent of the adjusted base quota level, the President will, by proclamation, impose quotas at the adjusted base quota level.

However, the President may suspend any proclamation if he determines that (a) such action is required by overriding economic or national security interests, recognizing the importance to the Nation of the economic well-being of the domestic livestock industry, or (b) the supply of products covered by the Act will be inadequate to meet domestic demand at reasonable prices.

Meat imports did not approach levels which would have triggered quotas in the first 3 years, 1965-67, covered by the Act. In 1968, however, meat imports into the United States increased sharply, and in the fourth quarter it became apparent that the estimated imports would exceed the trigger level of 1,054.3 million pounds. To avoid a Presidential proclamation of quotas at the adjusted base quota level of 950.3 million pounds, a voluntary restraint program was initiated between the exporting countries and the United States. This program set the level of allowable imports at 990 million pounds, a quantity between the adjusted base quota and the trigger level, thus limiting meat imports into the United States for the remainder of the year.

The voluntary restraint program continued in 1969 and the first half of 1970. In 1969, allowable imports under the restraint program were set at 1,035 million pounds. For 1970, the level was set at 1,061.5 million pounds. However, as a result of high meat prices in the United States relative to the world market and an abundant foreign supply of beef, it appeared that imports into the United States would increase substantially in 1970. Despite voluntary restraints, estimated meat imports exceeded the trigger level of 1,098.7 million pounds on June 30, 1970; consequently, the President proclaimed a limitation of imports. At the same time, the President suspended the limitation, as authorized by the Act, having determined that this action was required by overriding economic or national security interests of the United States (sec. 2, para. dl).

Also, by Executive order, the President delegated his authority to the Secretaries of State and Agriculture to institute a new restraint program setting allowable imports at 1,140 million pounds. This restraint level was increased to 1,160 million pounds in the fourth quarter of 1970 and continued in effect for 1971.

Beef, the major item covered by the Meat Import Act, accounts for more than 90 percent of meat imports. Critics of the Act argue that beef imports are primarily of a lower grade and provide a major source of meat that is in short supply in the United States. They contend that U.S. cattlemen concentrate on producing fed cattle to maximize their returns. This practice, coupled with decreasing numbers of dairy cows for slaughter, has resulted in a smaller supply of domestically produced nonfed beef.

Imported fresh, chilled, or frozen beef, the critics maintain, does not compete directly in the marketplace with U.S.-produced fed beef. Therefore, restricting meat imports will not appreciably affect the price of higher grade beef cuts produced domestically. However, restricting imports of lower grade beef does threaten prices paid by consumers for hamburger, frankfurters, and other products made from manufacturing beef. The critics conclude that the import regulation should be liberalized because of the likelihood of continued supply shortage of lower quality domestically produced beef. It has been proposed that the quota include a component for demand as well as domestic commercial production.

On the other hand, supporters of restricted imports see a need for some protection against virtually unlimited importation of beef. The Meat Import Act gives the cattle industry basic protection from excessive imports. Advocates

of restricted imports point out that the beef cattle industry is the largest single segment of U.S. agriculture and the very basis of its agricultural economy, accounting for 26.5 percent of total cash receipts from farm marketings in 1969. The supporters also point out that favorable U.S. market conditions have attracted foreign beef suppliers. They contend that repeal of limitations on meat imports would lower domestic prices, causing an exodus from cattle raising, and a subsequent increase in prices to a point where producers would be drawn back into the industry. As a result, this Nation would become a dumping ground for foreign beef exporters, causing an intensification of the cattle cycle and lower prices and incomes to U.S. cattle producers.

SCOPE OF THE ANALYSIS

This report examines the implications of possible changes in import regulations and policies on beef. Probable livestock prices, domestic production of beef and pork, and beef imports were projected and compared for the 1970-80 period, under both current and selected alternative beef import policies.^{1/} Initially, prices, commercial slaughter, and imports of beef were projected under the current quota regulation. Next, alternative policies for regulation of beef imports were incorporated into the model, and the ensuing prices, slaughter, and imports were projected through 1980. These simulated results of different import regulations were then compared with the projected values under the current regulation.

Many alternative import strategies could be hypothesized and introduced into the model for testing. Only a limited number of alternatives can be presented at one time; the five presented in this study were selected for the following reasons: Two alternatives, complete restriction of beef imports and virtually unlimited trade, present the limits of what might happen under various forms of regulation. The other three alternatives present more moderate positions. One was selected to represent moderate import restriction, another to represent consumer interest in a stable supply of nonfed beef, and the third to represent producer interest in stability of Choice steer prices. All of these more moderate alternatives are similar to specific proposals which have been suggested in recent years by producer and consumer groups.

The purpose of simulating these alternative policies is not to predict what import policies and levels of beef imports might be in the future, or what is "best" or "least best" for producers, consumers, and other parties having an interest in the question. The purpose is to project and compare results of current policies and selected alternative policies under assumptions with respect to such variables as population, income, feed grain prices, and initial levels of cattle prices, inventories, and production. These assumptions are held constant for both the base projection and all alternatives simulated.

^{1/} These projections were based on a recursive model of the livestock industry published in U.S. Department of Agriculture Technical Bulletin No. 1426, "A Dynamic Price-Output Model of the Beef and Pork Sectors."

Simulated results present the probable effects of each import strategy in terms of changes in marketings of fed and nonfed cattle; commercial hog slaughter; per capita supply of beef and pork; the prices of Choice steers, barrows, and gilts; and the beef cow inventory. Changes in any of the assumptions or initial conditions would alter the projected values of these variables.

ALTERNATIVE BEEF IMPORT POLICIES

The two import policies selected for this study that define the practical limits of variation in beef import regulations are:

Alternative I--Zero Imports

Alternative I, a "protectionist" policy, would prohibit beef imports after January 1, 1975. It was assumed that the change in this policy would be made gradually. This strategy was introduced into the base projection model by progressively reducing quarterly beef import estimates 20 percent each year, commencing in 1971. Thus, estimated quarterly beef imports for 1971 were decreased 20 percent from 1970 levels, 1972 quarterly estimates by 40 percent, etc., until the first quarter of 1975 when estimated beef imports were set equal to zero. Consequently, a total restriction of beef imports would be in effect for the remainder of the forecast period, 1975-80.

Alternative II--Doubling Imports

Alternative II may be considered a proxy for a "liberalized" trade strategy, whereby the quota would be doubled. This strategy was incorporated into the model by doubling all quarterly estimates of beef imports after January 1, 1971.

For hypothetical policies which do not entirely prohibit beef imports, it was assumed that an adequate supply of beef is available for export to the United States. This assumption is necessary since the model deals with domestic supply and demand conditions, and does not incorporate the supply behavior of foreign producers and exporters. However, given the likelihood that in the near future the United States will continue to have favorable market conditions, which in turn will attract desired beef imports, foreign exports will probably be available.

Three other alternative strategies selected to represent more moderate positions are:

Alternative III--Moderate Restriction of Imports

Alternative III introduces a quota regulation that is somewhat more restrictive than the current policy. It was considered to simulate an intermediate policy between Alternative I, a complete elimination of beef imports, and the current regulation.

The quota for a given calendar year was specified at the beginning of each year by taking 6.4 percent of the preceding year's domestic production of beef, and dividing it evenly among the four quarters. Limiting beef imports to 6.4 percent of domestic production (a reduction similar to a recent proposal) is more restrictive than the current regulation, since in recent years imports under the Meat Import Act of 1964 amounted to approximately 7.5-8.0 percent of domestic beef production. The imposition of quarterly allotments removes the flexibility importers previously enjoyed in adjusting to seasonal slaughter patterns in exporting countries. This alternative was introduced into the base projection model commencing January 1, 1971, and simulated for 10 years.

Alternative IV--Maintaining the Nonfed Beef Supply

The objective of Alternative IV was to maintain the per capita supply of nonfed beef within specified limits via beef imports. First, this strategy assumes that beef imports will continue to consist of lower grade beef for manufacturing purposes. Thus, when the per capita nonfed beef supply falls below a specified limit, beef imports will increase and vice versa. Second, it assumed that the desired limits are set at 36-40 pounds per year, since the average annual per capita nonfed beef supply in the base projection period was 36 pounds. This strategy was introduced into the base model by specifying the quarterly limits of per capita nonfed beef supply as 9-10 pounds, seasonally adjusted. Whenever the initial quarterly estimate of per capita nonfed beef supply fell outside of this seasonally adjusted limit, it was set equal to the specified limit. Then, the necessary level of beef imports to satisfy the specified level of nonfed beef per capita supply was determined. This alternative was simulated for the entire projection period July 1, 1970, through 1980. It assumed existence of a shortrun supply forecast so that shipment from exporting countries can be increased or decreased sufficiently one or two quarters in advance.

Alternative V--Price Maintenance

Alternative V involves maintaining prices of Choice-grade steers within specified limits about the projected trend of such prices in the base run. This was accomplished by regulating beef imports. While imports are considered to be of nonfed quality, they have a substantial impact on fed beef price. The prime objective of this import strategy was to decrease the variability in Choice steer prices by removing most of the seasonal and cyclical fluctuations.

EMPIRICAL RESULTS AND IMPLICATIONS

The price-output model was used to simulate market performance of the beef and pork industries for the period July 1, 1970, through December 31, 1980. The "base" projection as indicated involved operation of the model to simulate prices and output to 1980. Then, each of the five alternative beef import

strategies was incorporated and the modified models used to simulate the resulting prices and production over the 1971-80 period. Finally, the projected results of alternatives are compared.

Both the cattle and hog subsectors of the livestock industry contain persistent price-production cycles; large production from large inventories of breeding stock results in low prices which in time reduce the number of animals in breeding herds. The beef cycle is more enduring, since 2-3 years are needed for a new-born heifer calf to grow into a producing beef cow. To represent this basic mechanism of the cycle, the model commences with determination of domestic production from livestock inventories, imports, exports, and changes in stocks of beef and pork products.

Most beef calves and yearlings not intended for herd replacement are placed on feed. The calf crop and the January 1 inventory of beef calves less than 1 year old serve as primary indicators of feedlot placements depending on the season of the year. The beef-corn ratio, an indicator of the gross feeding margin, also affects feedlot placements. By definition, fed cattle marketings are solely determined by earlier placements while their average weight is also conditioned by the beef-corn ratio. Commercial fed beef production is the product of fed cattle marketings and their average weight.

Domestic nonfed beef production consists primarily of cull beef and dairy cows; but the rate of cull is conditioned by feeder cattle prices, corn prices, and range conditions. Thus, when favorable beef and corn prices (and price relationships) are stimulating placements of cattle in feedlots and heavier weights of fed cattle, they are also inducing a lower cull rate leading to lower domestic nonfed beef production. On the other hand, beef and corn prices less favorable for feeding tend to lower feedlot placements and average weights of fed cattle. At the same time, cull rates are increased and some young animals are shifted to immediate slaughter as nonfed beef.

Domestic supplies of lower grade beef and wholesale beef prices affect the quantity of beef imports. However, world market conditions and the incentive to maintain or increase quotas keep exports to the United States near the maximum quantity of imports allowable.

Thus, beef consumption in the United States consists of a fed component determined by placements, subsequent fed cattle marketings and average weight; and a nonfed component determined by cull rates, feeding profitability and imported product. The wholesale market portrays the meeting of retail and institutional buyers representing consumers, as well as packers and processors holding the supply of domestic and imported beef products. The price of both Choice-grade carcass and manufacturing beef is affected by the per capita fed beef supply, per capita nonfed beef supply (including imports), and per capita pork supply due to the degree of substitutability of meat products by consumers. Therefore, a change in imports affects fed beef prices through per capita nonfed supply as well as the price of manufacturing beef; and a change in the fed beef supply affects manufacturing beef prices. Consumer incomes, tastes, and preferences also affect these prices.

Wholesale prices and byproduct values in turn determine live steer prices which are the primary determinants of feeder cattle prices along with feeding margins and range conditions.

The production-pricing sequence has longer run effects on changes in the beef cattle inventory--for example, the cattle cycle and the future supply of fed versus nonfed beef. The beef cow inventory, exclusive of death loss, changes as the number of beef heifers added to the herd exceeds or falls below beef cow slaughter. Heifer replacement depends on the number of heifer calves on hand the previous year along with current and prospective feeder cattle prices. While cow slaughter is largely determined by biological considerations which are mandatory, it can be stepped up or retarded when feeder cattle prices appear favorable or unfavorable.

Choice beef prices can change because of a shift in the per capita supply of either fed or nonfed beef. This price change is reflected in feeder prices which in turn affect heifer replacements and/or cow slaughter. The shift in the calf crop produced eventually changes feedlot placements, fed cattle marketings, and even future cow cull which influences the supply of both fed beef and nonfed beef.

Since both the period and amplitude of the beef and hog cycles may be affected, the simulated prices and output for each alternative may represent a different stage of the cycle in any given projection year. Therefore, differences in prices and quantities from the base in any given year may be greater or smaller than one would expect from the import regulation alone because of the different stage in the cycle. Both Choice steer and hog prices showed similar upward trends throughout the decade for each alternative considered.

Base Projection Under Current Import Policy, 1970-80

Since the model is recursive, data given the model were the initial conditions existing prior to July 1, 1970, and values of exogenous variables through 1980. Thus, values of the following endogenous variables are known: Prices of cattle, hogs, and meat for the preceding four quarters; January 1, 1970, inventory variables such as beef calf numbers, beef cow numbers, and beef heifers available for replacement. Regarding the values of some exogenous variables, civilian population (48 States) was assumed to reach 224 million in 1980, based on the Census Bureau Projection Series C. Per capita personal income in current dollars was assumed to reach \$5,395 by 1980, implying an annual growth rate of nearly 5 percent during the 1970-80 period. The price of No. 3 corn at Chicago was increased 2 percent per year from the 1970 levels to \$1.57 in 1980 to serve as a proxy for increases in nonfeed production costs during the 1970's. Range conditions were assumed to hold at average levels during the projection period, while byproduct credits for beef and pork were held at 1970 levels. Given the lagged values of variables within the system and the values of the variables outside the system, simulation of the model as developed through 1980 was accomplished.

The annual average values of variables for calendar year 1970 provide a basis of reference and serve to describe the system. Fed cattle marketings totaled 25.67 million head, while 8.1 billion pounds of nonfed cattle were marketed. In addition, beef imports were estimated to total 1.7 billion pounds for 1970. These conditions yielded a per capita fed beef consumption of 81 pounds and a per capita nonfed beef supply of 36 pounds. Commercial hog slaughter in the base simulation totaled 20.3 billion pounds; per capita pork supply was 68.5 pounds. The average live value for Choice steers was just under \$30, while live hog prices averaged \$22.50 per hundredweight. The model simulated the sharp drop in hog prices during the year--the price in the fourth quarter of 1970 was estimated at \$15.40 per hundredweight. Finally, sows farrowing for 1970 were estimated at 14.1 million head and placements of cattle on feed at 25 million head.

The values of selected variables for the 10-year projection period, 1971-80, are presented in figures 1 and 2.^{2/} Over the 10-year period, marketings of fed cattle exhibited an average growth of 4 percent per year, ranging from 1 to 7 percent. On a per capita basis, this averaged out to a lower rate of increase (3 percent per year) because of the growth in population. Marketings of nonfed beef were somewhat more variable and averaged a 1-percent decline per year for the 10 years. Almost all of this drop occurred during the latter years (as more cattle were put on feed in response to increasing Choice steer prices). Year-to-year change in marketings of nonfed beef ranged from an 18-percent decrease to a 40-percent increase. Beef imports showed an average increase of 2 percent per year in keeping with the current import regulation that allows imports to grow with domestic production.^{3/} However, simulated quantities of imports ranged from a drop of 10 percent in 1 year from the previous year's value to an increase of 12 percent. Much of the increase came during the latter years of the period in response to the decline in nonfed cattle marketings. On a per capita basis, the supply of nonfed beef followed domestic nonfed slaughter, averaging a 1-percent decline over the period. However, the year-to-year change in per capita nonfed supply was somewhat less (minus 13 percent to plus 16 percent), owing to the mitigating effect of beef imports.

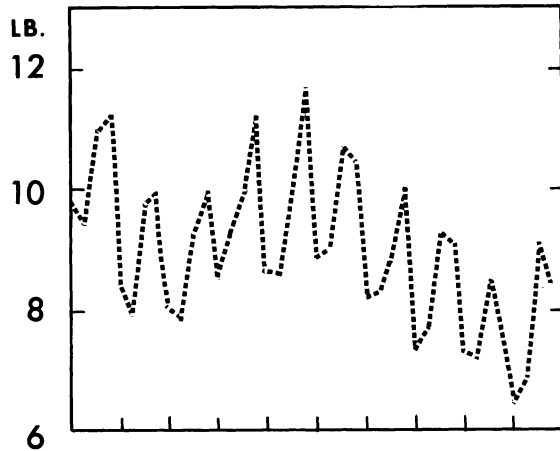
Commercial hog slaughter held steady throughout the 1970-80 simulation, ranging from a 3-percent decrease to a 4-percent increase in the year-to-year change. Per capita pork supplies also showed the same degree of variation.

^{2/} Simulated values of data for the projection period and the computer program are available from the authors upon request.

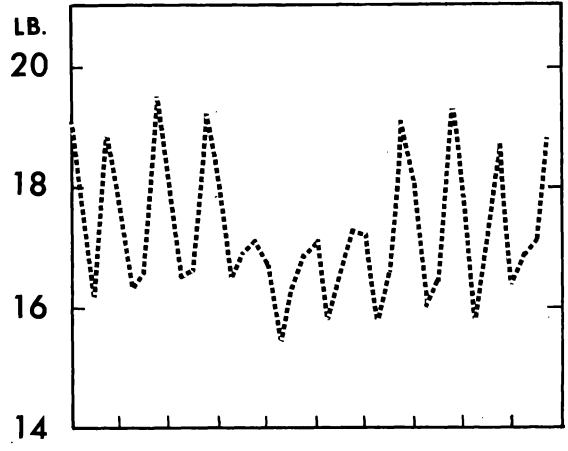
^{3/} Simulated imports in the base projection were limited to a seasonally adjusted annual maximum of 7.5 percent of domestic beef production--a restraint based on the maximum annual level of imports during the 3 years immediately preceding the simulation (1967-69). Due to modifications of import quotas in late 1970 and again in 1971 and to an increase in imports of types of beef not subject to the meat import law, actual beef imports amounted to 8.3 and 8.0 percent of domestic production in these years. If similar quota modifications are made in future years and if imports of nonquota beef continue to grow, the simulated levels of the base projection would be correspondingly low.

BASE PROJECTION OF SELECTED VARIABLES

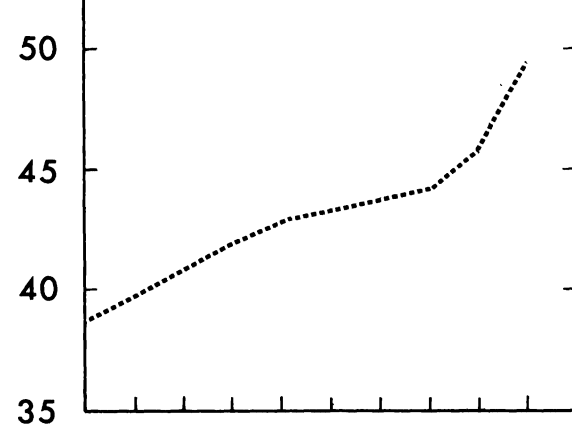
(A) PER CAPITA NONFED BEEF SUPPLY



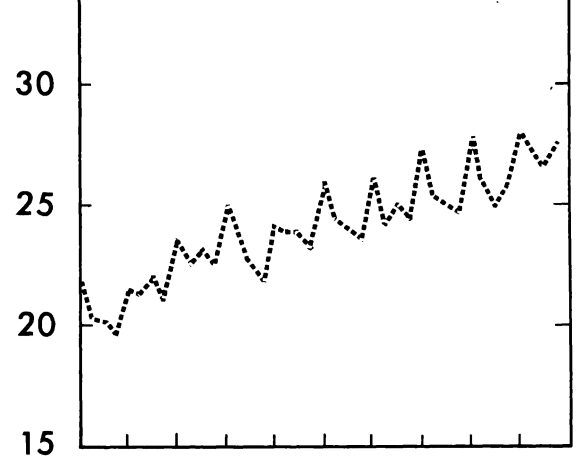
(B) PER CAPITA PORK SUPPLY



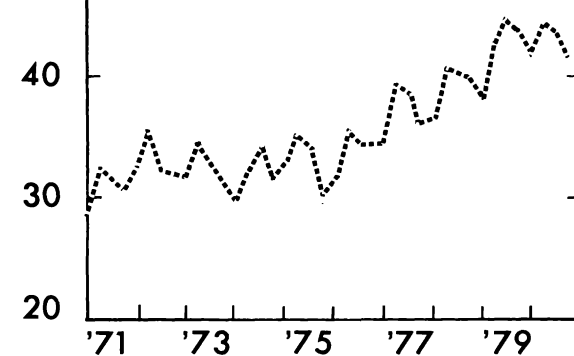
(C) JAN. 1 BEEF COW INVENTORY



(D) PER CAPITA FED BEEF CONSUMPTION



(E) CHOICE STEER PRICE



(F) BARROWS & GILTS PRICE

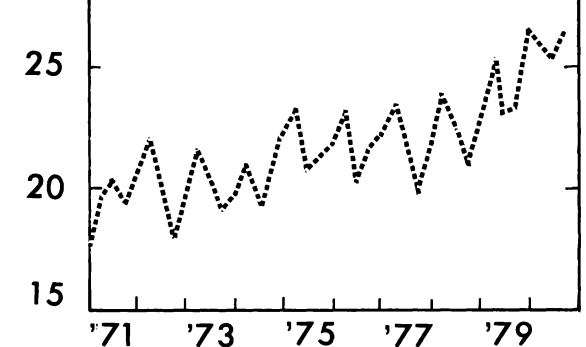


FIGURE 1

BASE PROJECTION OF BEEF IMPORTS

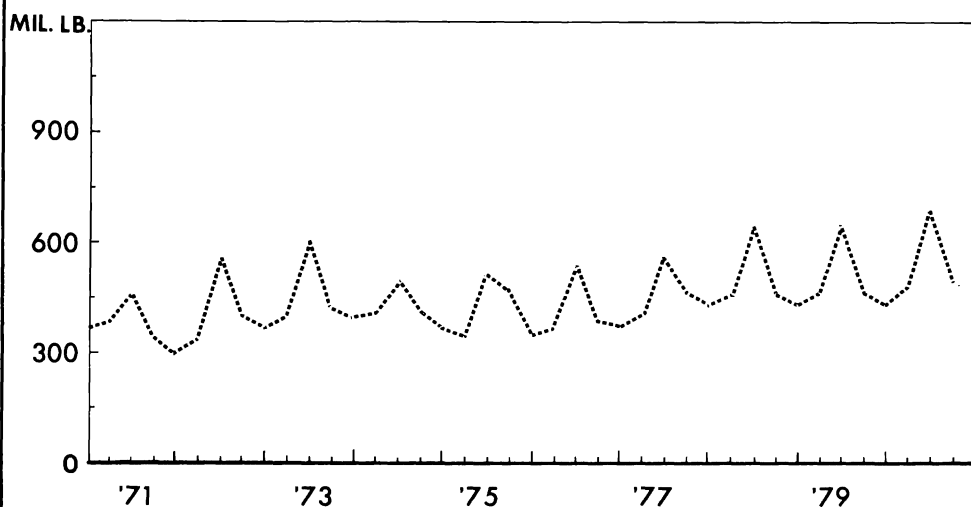


FIGURE 2

Base Projection and Alternative I Estimates of Beef Imports

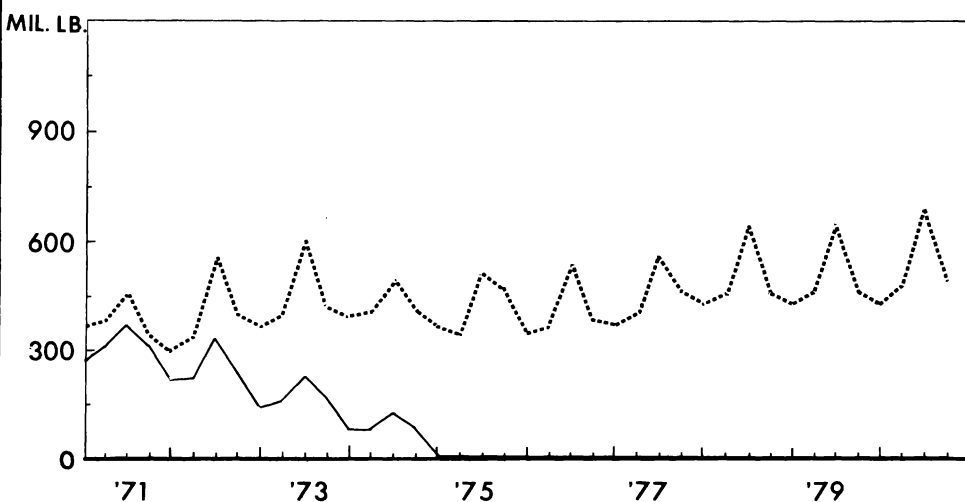


FIGURE 3

Simulated Choice steer prices showed an average increase of 4 percent per year. This increase, despite the rise in total beef supply--principally fed beef--can be attributed to growth in income and an increasing consumer preference for beef. Barrow and gilt prices also increased 2 percent per year in response to growth in income. However, hog prices ranged from a 15-percent decrease in 1 year from their previous level, to a 10-percent increase over a year earlier during the period. This variability in hog prices greatly exceeded production variability and stemmed from the combined cross effects of changes in nonfed beef supplies and changing pork supplies.

January 1 beef cow inventories increased an average of about 1 million head per year over the 10-year period. However, a definite cattle cycle can be seen. The January 1 beef cow inventory averaged a 1.1-million-head annual increase through 1975, then declined to a 0.5-million-head per year increase in 1976-78, and then increased again to a 2-million-head annual growth rate in 1979 and 1980.

The base projection under the current import policy may be regarded as an initial experiment with the price-output model operating past the range of time series values used to develop its coefficients. The simulated base values represent a projection of both the economic and institutional structure of the 1955-70 period for which the model was developed. Thus, these values represent an extension of these historical conditions into the 1970's, given assumptions about population, income, and input prices. The projection period is also free of random disequilibrating influences such as drought conditions and other outside forces. These simulated values serve as a basis for comparing alternative policies for import regulations.

Simulated prices as well as production and beef cow inventories under Alternatives I and II (no imports and virtual elimination of restrictions) show the extreme limits of change which might be expected. All of these projections--including the base projection which simulates a continuation of the current import policy--are derived from the same model of the operation of the livestock industry and the same set of values for variables outside the livestock industry such as income, population, and feed prices.

Alternative Beef Import Policies

Under Alternative I, beef imports were gradually reduced to zero by 1975, as illustrated in figure 3. Figure 4 shows the effect of this alternative on selected variables, while table 1 summarizes the average change of selected variables from the base projection values for all alternatives over 3-year intervals. The first 3-year period, 1972-74, shall be referred to as the initial period, 1975-77--the middle period, and 1978-80--the final period. Since the long-term effects of alternative meat import policies were of greater interest, 1971 was excluded because it was a year in which adjustments were just commencing.

Table 1.--Three-year annual average change of selected variables from the base projection under alternative import policies I-V, 1972-80

Alternative import policy	Period	Beef imports	Jan. 1 beef cow inventory	Fed cattle marketings	Nonfed cattle marketings	Commercial hog slaughter	Per capita fed beef consumption	Per capita nonfed beef supply	Per capita pork supply	Steer price	Hog price
		<u>Bil. lb.</u>	<u>Mil. head</u>	<u>Mil. head</u>	<u>Bil. lb.</u>	<u>Bil. lb.</u>	<u>Lbs.</u>	<u>Lbs.</u>	<u>Lbs.</u>	<u>\$/cwt.</u>	<u>\$/cwt.</u>
I	1972-74:	-1.0	0	.1	-1.7	-.3	1.6	-9.5	-2.0	3.28	1.85
	1975-77:	-1.7	2.3	1.7	-.9	.9	8.6	-9.8	3.3	.83	0
	1978-80:	-2.0	3.0	3.0	1.6	.2	8.8	-4.7	1.1	-1.84	.14
II	1972-74:	1.2	-.5	-1.1	1.2	-.6	-3.5	8.8	-2.0	-2.75	-.35
	1975-77:	1.4	-.9	-1.4	.3	-.2	-4.0	7.1	-.4	-1.54	-.72
	1978-90:	1.3	-1.1	-.3	2.3	-.3	-2.3	11.8	-.6	-4.23	-1.19
III	1972-74:	-.2	0	.1	.2	-.3	.6	-.5	-1.1	-.06	.43
	1975-77:	-.1	-.3	-.2	-.3	1.5	.1	-1	1.9	.70	-.16
	1978-80:	-.3	1.7	.7	1.0	-.1	2.7	1.3	.3	-1.53	-.08
IV	1972-74:	0	.4	-.1	.2	-.5	.8	.5	-2.0	-.42	.64
	1975-77:	-.1	.4	.4	.5	.2	.9	.8	1.0	-.84	-.50
	1978-80:	.3	-.8	-.1	1.2	0	-.5	4.4	.2	-1.97	-.63
V	1972-74:	-.1	0	0	.5	-.4	-.6	.7	-1.7	-.32	.33
	1975-77:	-.4	.2	.4	-.3	.3	1.6	-2.6	1.2	.48	-.13
	1978-80:	-.9	2.2	1.7	1.7	.1	5.0	.7	.5	-2.78	-.29

Base Projection and Alternative I Estimates of Selected Variables

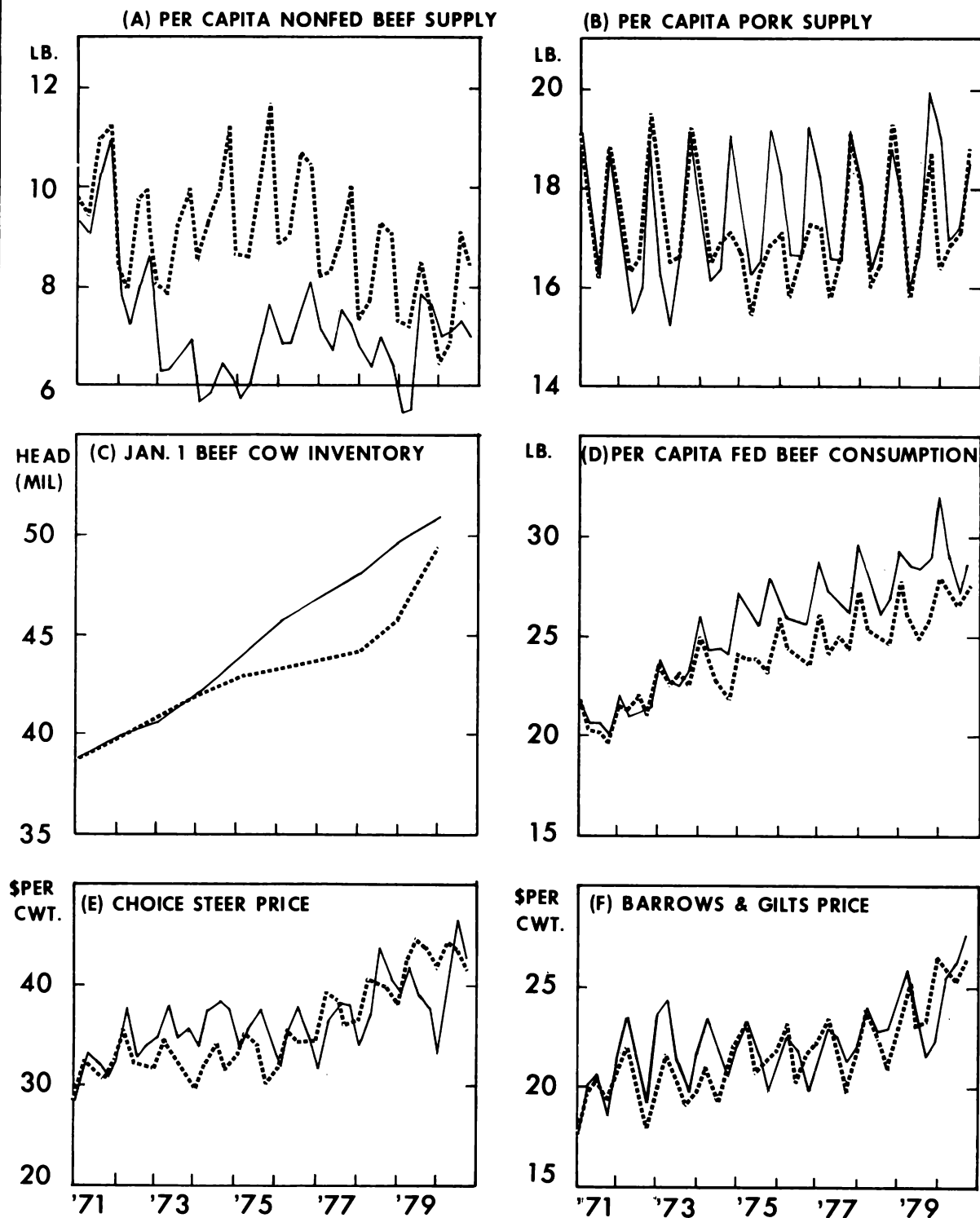


FIGURE 4

In the initial period, 1972-74, the reduction in beef imports averaged 1.0 billion pounds, compared with the projected values under the current policy. Consequently, the per capita supply of nonfed beef declined. Since fed beef prices are affected by changes in the nonfed supply, Choice steer price averaged \$3.28 per hundredweight higher, stimulating greater expansion in the domestic cattle industry throughout the next two periods. For example, in the final period, the January 1 beef cow inventory increased an average 3 million head per year above the base projection value. Also, figure 4C illustrates that sustained growth of beef cow inventory took place from 1974 through 1980. Marketings of nonfed beef were 1.7 billion pounds lower in the initial period because cow herds commenced to increase and 0.9 million more head of cattle were put on feed in 1974. Initially, commercial hog slaughter was 0.3 billion pounds lower as breeding herds were increased, and then slaughter increased after 1974. Hog prices averaged \$1.85 per hundredweight above the base projection values in the initial period with no significant change the last two periods. Although the average per capita supply of pork was 3.3 pounds higher in 1975-77, there was no change in hog price as a result of Alternative I, because the smaller supply of nonfed beef caused hog prices to increase, offsetting the effect of greater pork supplies. The interaction also occurred in the final period.

The reduction in imports reached 2.0 billion pounds in the final period. As a result of the larger beef cow herd, marketings of fed cattle were higher, causing an average reduction of \$1.84 per hundredweight in the final period. Also, when compared with the base projection under current policy, marketings of nonfed cattle were higher in 1978-80 because of a larger breeding herd.

Alternative II: Imports of beef were allowed to double (fig. 6). Since the supply of nonfed beef has a substantial impact on fed cattle prices, Choice steer prices were consistently below those of the base projection (fig. 5). Owing primarily to the higher per capita supply of nonfed beef in all periods (table 1), the reduction in steer prices averaged \$2.75 per hundredweight in the initial period and \$4.23 per hundredweight in the final period. Consequently, beef cow inventories were consistently lower than those of the base projection; the reduction averaged 1.1 million head in the final period.

Fed cattle marketings were lower because of the lower Choice steer prices and a smaller breeding herd. Therefore, average per capita consumption of fed beef was lower in each period.

Despite increased beef imports, nonfed cattle marketings averaged 1.2 billion pounds higher in the initial period and continued higher in subsequent periods, since fewer cattle were placed on feed. Thus, the effect of increased imports on the supply of nonfed beef was reinforced. The per capita supply of nonfed beef averaged 8.8 pounds higher than the base projection values in the initial period and 11.8 pounds higher in the final period.

Commercial hog slaughter was generally lower, averaging 0.6 billion pounds less in the initial period and 0.2 billion pounds less in the middle period. Although the average per capita supply of pork declined in each

Base Projection and Alternative II Estimates of Selected Variables

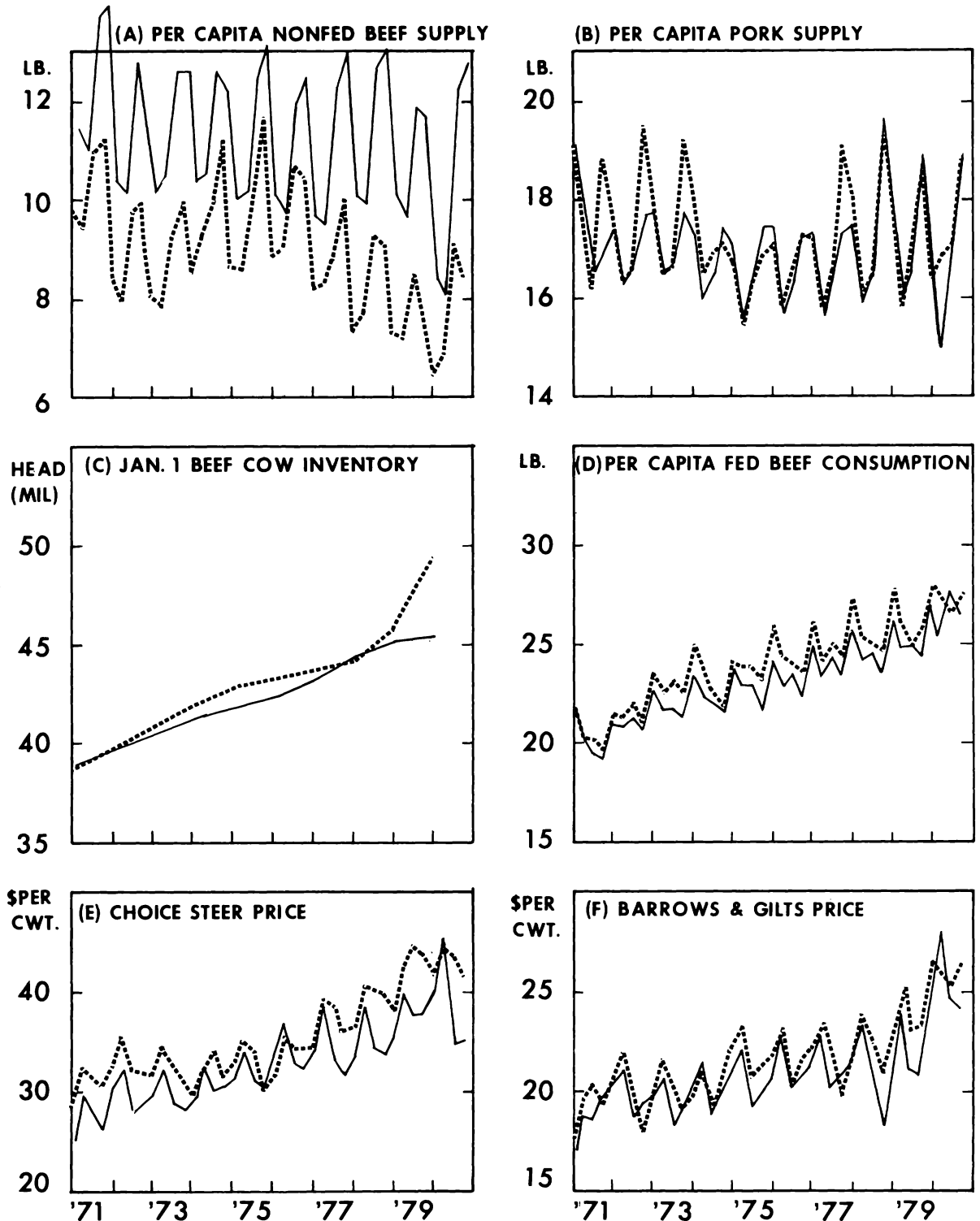


FIGURE 5

Base Projection and Alternative II Estimates of Beef Imports

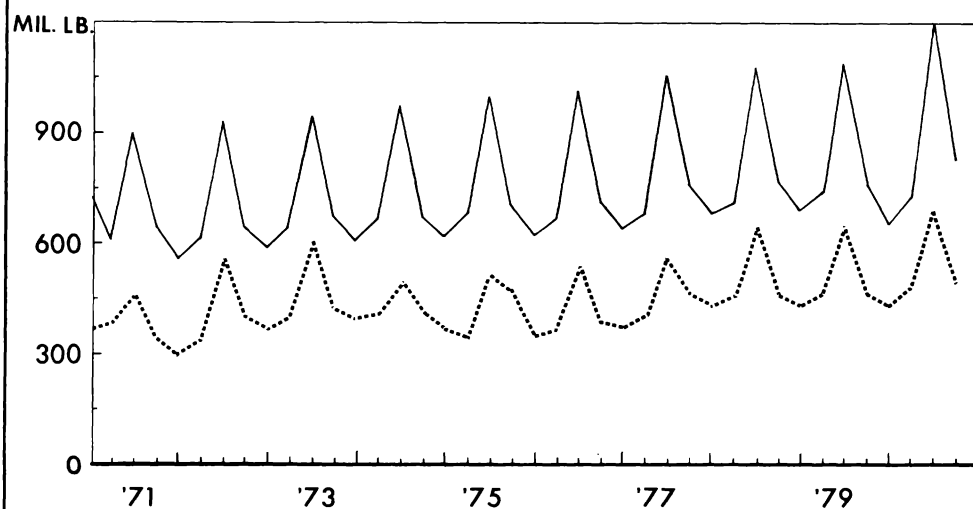


FIGURE 6

Base Projection and Alternative III Estimates of Beef Imports

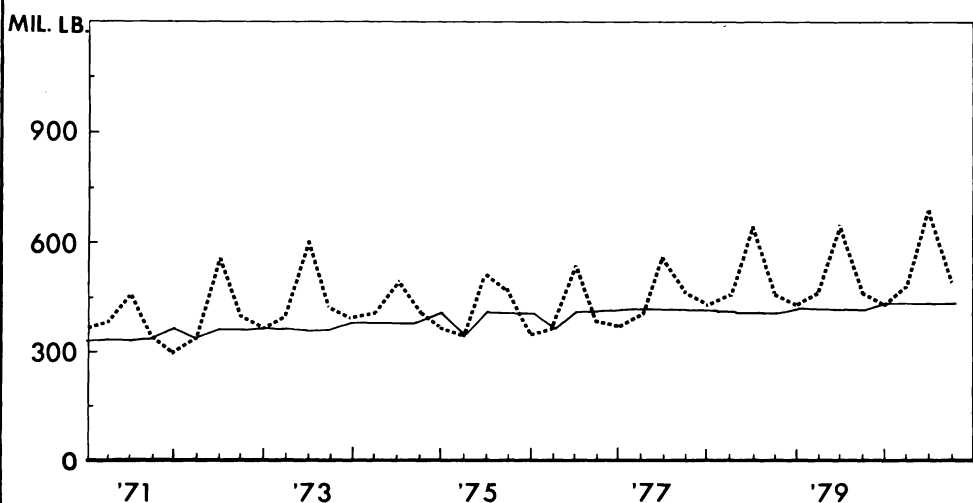


FIGURE 7

period, average barrow and gilt prices were lower in each period. This reduction in hog price, which averaged \$1.19 per hundredweight in the final period, was caused by the increased supply in nonfed beef.

Prices of both steers and hogs reflect the interaction of meat supplies, since both are affected by the substantial increase in per capita supply of nonfed beef. Under the increased import strategy, prices were lower at all market levels. Consumers were supplied with more meat; however, all of this increase was of lower grade beef because of a reduction in fed cattle marketings. Marketings of nonfed cattle were higher, since liquidation took place as beef cow inventories declined in response to unfavorable prices.

Simulated results under the more moderate variations in import policy still show significant longrun effects on the domestic cattle industry.

Alternative III: A quota more restrictive than the current regulation, administered on a quarterly basis, was simulated by Alternative III. As expected, imports were generally lower than base projection values, but with little seasonal variation (fig. 7). The average reduction in beef imports ranged from 0.1 billion pounds in the middle period to 0.3 billion pounds in the final period (table 1).

In the 1972-74 period, this policy had no significant effect on marketings of fed or of nonfed cattle. Choice steer prices were little changed, since the effects of higher fed cattle marketings and a smaller supply of nonfed beef offset each other. Slight variation in prices and the beef-corn price ratio during the initial period did lower the January 1, 1975, beef cow inventory 300,000 head below the base level. This held for the next 2 years. As a result, cattle slaughter was down slightly during the mid-period. The per capita nonfed beef supply averaged 1.6 pounds below the base level due to the slight reduction in beef imports and curtailed nonfed slaughter as the cow inventory finally increased during 1977 in response to higher steer prices. This reduction in the nonfed beef supply during the mid-period pushed Choice steer prices up slightly (a 70-cent average over the 3 years) and nearly offset the increase in pork production, holding hog prices steady. The more favorable steer prices in the latter part of the mid-period simulated herd rebuilding; the January 1 beef cow inventory averaged 1.7 million head larger than that of the base period during 1978-80. Both fed and nonfed beef production increased, bringing about a \$1.50 average reduction in steer prices in the last 3 years.

The strategy resulted in slightly lower cattle prices during the latter years. Beef imports were more stable at lower levels than under current regulations throughout the period due to the limiting nature of the regulation. Fed and nonfed beef supplies increased because growth in the domestic industry more than offset the reduction in imports.

Alternative IV: The purpose of Alternative IV was to stabilize the per capita supply of nonfed beef via imports. The objectives of this policy were achieved, especially in the last 5 years (fig. 9A). Beef imports were not significantly affected until the last quarter of 1975, when they were substantially lower than the base projection, reducing the per capita supply

Base Projection and Alternative III Estimates of Selected Variables

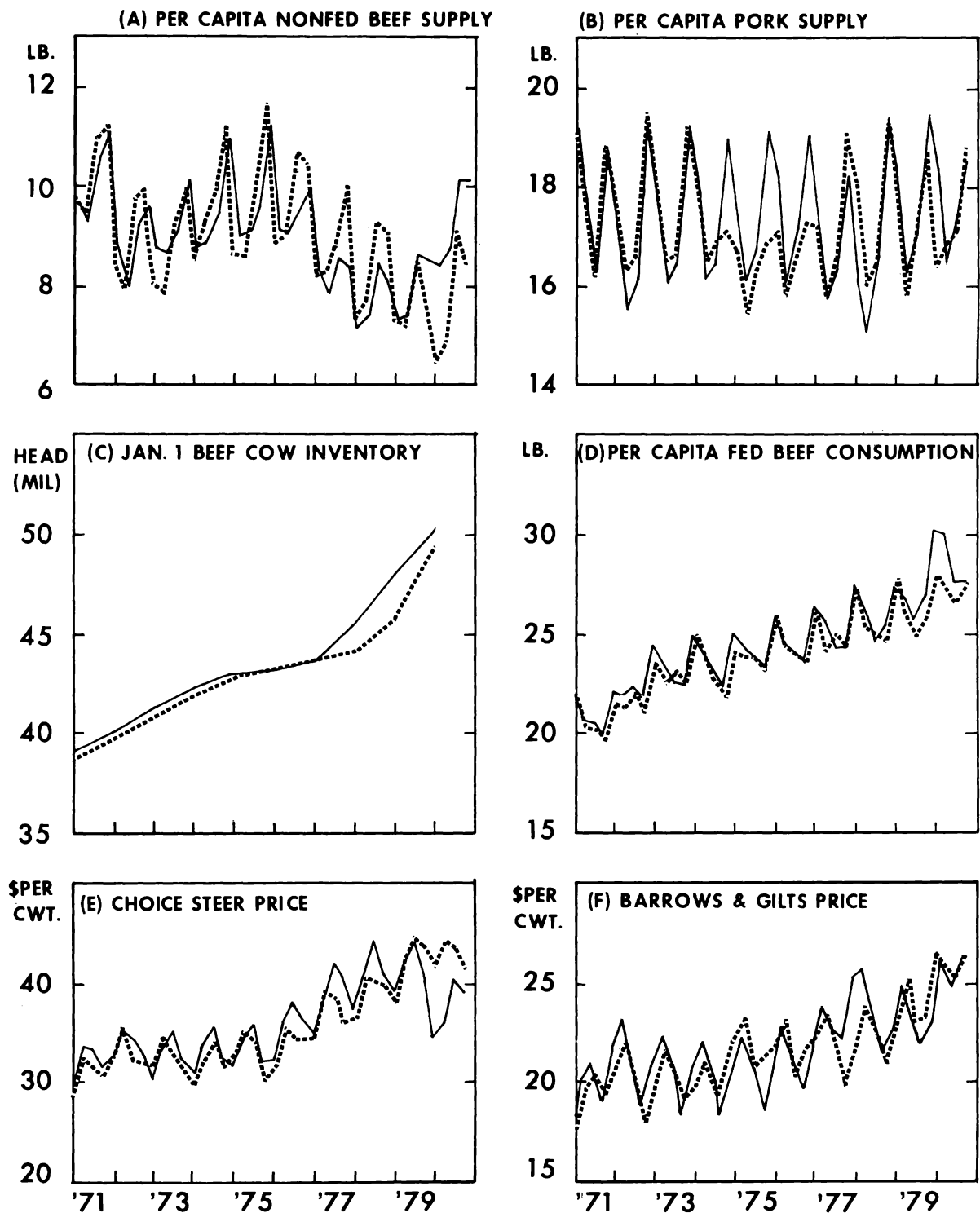


FIGURE 8

Base Projection and Alternative IV Estimates of Selected Variables

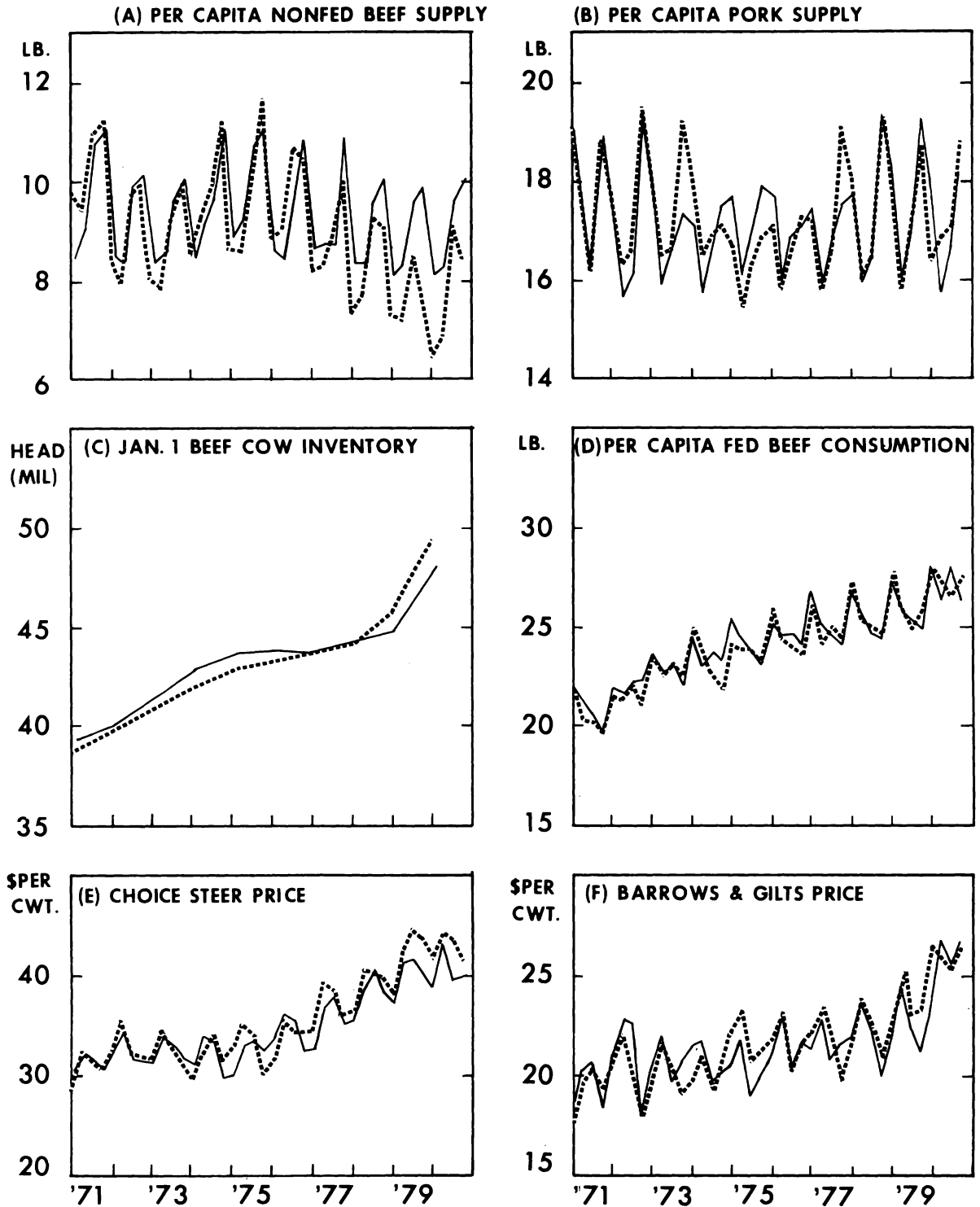


FIGURE 9

of nonfed beef (fig. 10). To increase the per capita supply of nonfed beef to the specified level in the final period, beef imports were 0.3 billion pounds higher than base projections (table 1).

This alternative had no significant effect on either the hog sector or the growth of the domestic cattle industry because the beef cow inventories remained virtually unchanged. Consequently, fed cattle marketings did not change markedly until the final period. The larger supply of nonfed beef held live steer prices down in all periods. The lower steer prices in 1974 and 1975 restrained expansion of the beef cow inventory (figs. 9E and 9C). This appears to explain the higher marketings of nonfed beef in the final period when beef cow herds were being liquidated. The larger supply of nonfed beef reduced steer prices almost \$2 per hundredweight.

While this strategy did stabilize the supply of nonfed beef at higher levels in the later years, growth of the domestic cattle industry was stagnant in the middle period and somewhat lower in the final period, compared with the current beef import regulation.

Alternative V: Under Alternative Import Policy V, Choice steer prices were stabilized at specified levels via beef imports (fig. 11). Initially, no major effect resulted from this policy. Choice steer prices stabilized, averaging \$0.38 per hundredweight lower than base values (fig. 12E). Marketings of nonfed cattle were slightly higher as beef cow inventories remained relatively unchanged.

To maintain steer prices within specified limits during the middle period, beef imports were 0.4 billion pounds lower than base projection values. Owing to the \$0.48 per hundredweight higher steer price, the beef cow inventory averaged 0.2 million head higher. With continued price stability at a higher level through 1974-76, the beef cow inventory increased sharply after January 1, 1977. In the final period, the beef cow inventory averaged 2.2 million head higher. This rather rapid inventory buildup was accompanied by higher cattle marketings in the final period. Marketings of fed cattle averaged 1.7 million head higher; consequently, per capita consumption of fed beef was 5 pounds higher. Nonfed cattle marketings averaged 1.7 billion pounds higher. Although beef imports were lower, the per capita supply of nonfed beef averaged 0.7 pounds higher. Despite lower beef imports, increased marketings of cattle resulted in a reduction of \$2.78 per hundredweight in Choice steer prices in 1977-79.

In general, this strategy of stabilizing Choice steer prices through import variation was achieved at the expense of greater instability in beef imports and consequently in per capita supply of nonfed beef (figs. 11 and 12). However, higher growth in the domestic beef industry also occurred. The supply of meat available for consumption was slightly higher and longrun prices were not significantly affected.

The viability of this strategy is questionable, however. For example, the degree of supply flexibility needed in exporting countries may not be sufficient to achieve the variation in imports indicated in figure 11.

Base Projection and Alternative IV Estimates of Beef Imports

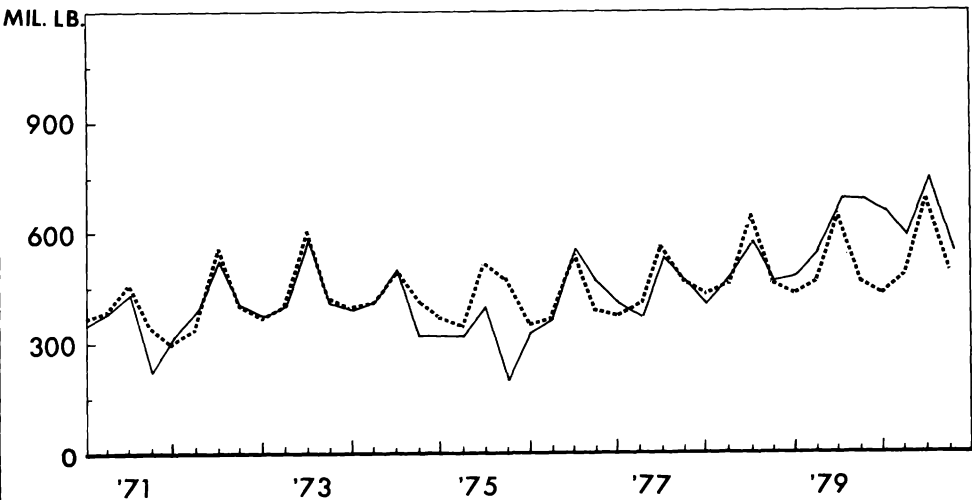


FIGURE 10

Base Projection and Alternative V Estimates of Beef Imports

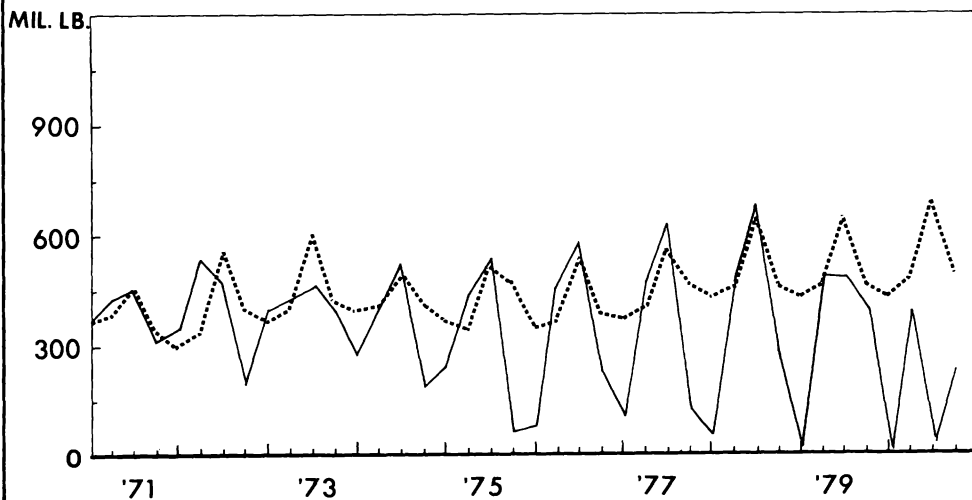


FIGURE 11

Base Projection and Alternative V Estimates of Selected Variables

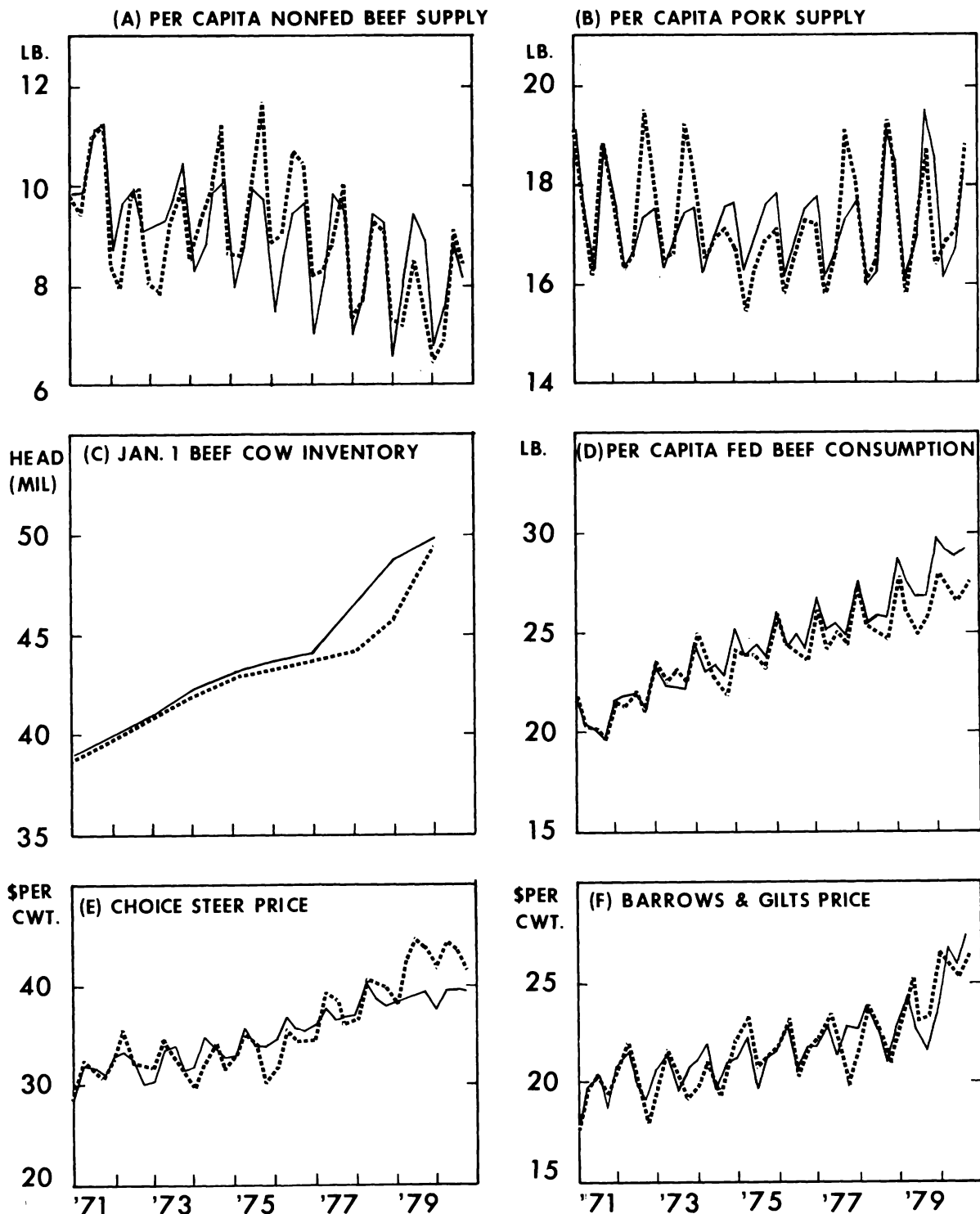


FIGURE 12

Comparison Among Alternative Policies, 1978-80

Simulated prices and output from each alternative import strategy are compared with the base projection in the previous section. Comparisons among the alternatives are useful; however, they are more complex since substantially more data must be considered. All alternatives use the same values as the base for variables outside the industry such as population and income growth. Since several years are needed for the full effects of an alternative to be felt throughout the industry, comparisons are made for the 1978-80 period only. Although effects of alternative strategies have had time to work through the system, the simulated values of variables do not portray an equilibrium situation. Relevant comparisons appear to be those among prices, quantities of meat available for consumption, industry growth, and the quantity of beef imports.

Under the assumption that the farm-retail price spread would be similar for all of the variants in import policy, prices of Choice-grade steers and hogs can be used as an indicator of the effect of changes in import regulation on consumer prices and on prices received by producers. Moreover, the January 1 beef cow inventory signals the rate of growth in the domestic cattle industry.

Although there are differences in prices of Choice-grade steers and hogs among alternative policies, they could be regarded as generally acceptable to producers under the current import policy and each of the five alternative strategies during the projection to 1980. The rather high prices of the latter part of the decade are consistent with increase in the general price level, and reflect the current rate of monetary growth. Quantities of beef and pork available for consumption could also be deemed adequate.

Longer Run Effects of Limiting Situations

In the period of the simulation, 1978-80, Choice steer prices were higher under the base projection (the current import policy) than under either Alternative I or II. Under Alternative I (no imports after 1975), steer prices averaged \$1.84 per hundredweight lower than the base, owing to expansion of the domestic cattle industry, particularly fed beef. Under Alternative II (doubling beef imports) steer prices averaged \$4.23 per hundredweight lower than the base in 1978-80, owing to a combination of increased imports and more domestic nonfed beef production.

Per capita fed beef supplies under Alternative I were 8.8 pounds above base projection levels while they were 2.3 pounds less under Alternative II. However, the per capita supply of nonfed beef under Alternative II was 11.8 pounds above the base projection level in the final period. But the per capita nonfed supply under Alternative I was 4.7 pounds below the base projection level. While the mix between fed and nonfed beef varied among these "extreme" policy limits and the current policy, the per capita supply of all beef was greater under Alternative II (9.5 pounds above the base), less under Alternative I (4.1 pounds above the base), and lowest under the base projection of current import policy.

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Expansion of the domestic cattle industry by 1978-80 was relatively greater under Alternative I and relatively lower under Alternative II. The 1978-80 January 1 beef cow inventory was 3.0 million head above the base average under Alternative I, but 1.1 million head below the base projection average under Alternative II.

Longer Run Effects Under More Moderate Changes in Policy

Prices of Choice steers averaged \$1.53 below the base projection level in 1978-80 under Alternative III, \$1.97 below the base under Alternative IV, and \$2.78 below the base under Alternative V. Prices were down under Alternative III because of slightly more fed and nonfed beef--all domestically produced. Steer prices in the final 3-year period were curtailed under Alternative IV, owing to a greater supply of nonfed beef. The lower prices under Alternative V were caused by substantially more fed beef production. Imports could not be curtailed sufficiently to counteract the 5-pound per capita increase in fed beef production.

The per capita supply of all beef available for consumption in 1978-80 was greater under Alternative V (5.7 pounds above the base). Alternative III yielded 4.0 pounds per person more than the base, while Alternative IV realized 3.9 pounds per person above the base level in 1978-80. Almost all of the increase was fed beef in the case of Alternative V, but the increased supply was all nonfed under Alternative IV. The quantity of both fed and nonfed beef was up under Alternative III.

The January 1 beef cow inventory averaged 2.2 million head above the base projection level under Alternative V, and 1.7 million head above the base under Alternative III. The inventory was 800,000 head below the average base projection inventory level under Alternative IV.